

Atty. Docket No. OPP031477US
Serial No: 10/749,578

Amendments to the Claims

Claim 1 has been previously cancelled. Please cancel Claims 4 and 5, add new Claims 10-21, and amend the remaining claims as follows:

1. (Cancelled)
2. (Currently amended) A method for forming a contact hole or a via hole in a semiconductor device comprising:
applying, exposing and developing a photosensitive film on a planarized metal insulation film or a planarized interlayer insulation film to form a photosensitive film pattern on a region to contain the contact hole or the via hole; and
dry etching the planarized metal insulation film or the planarized interlayer insulation film using the photosensitive film pattern as a mask and using a plasma having spiral movement such that sufficiently to form the contact hole or the via hole and round a top edge of the contact hole or the via hole thereby is rounded simultaneously as the contact hole or the via hole is formed.
3. (Currently amended) A method as defined in claim 2, wherein, ~~etching the metal insulation film or the interlayer insulation film~~ the plasma comprises using a gas of fluorine-containing series as an etching gas.
4. (Cancelled)
5. (Cancelled)
6. (Currently amended) A method as defined in claim 2, further comprising:
after forming the contact hole or the via hole is formed, forming a barrier metal film on an inner wall of the contact hole or the via hole; and

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filling the contact hole or the via hole with a metal material.

7. (Original) A method as defined in claim 6 wherein filling the contact hole or the via hole with the metal material comprises forming the metal material on the barrier metal film.

8. (Currently amended) A method as defined in claim 3, further comprising:
after forming the contact hole or the via hole ~~is formed~~, forming a barrier metal film on an inner wall of the contact hole or the via hole; and
filling the contact hole or the via hole with a metal material.

9. (Original) A method as defined in claim 8 wherein filling the contact hole or the via hole with the metal material comprises forming the metal material on the barrier metal film.

10. (New) The method of claim 2, wherein the dry etching step is performed in an asher.

11. (New) The method of claim 2, wherein the dry etching step comprises rotating the plasma in a magnetic field, the magnetic field generated by a coil surrounding a chamber under a state where an electric field is applied vertically downward in the chamber.

12. (New) A method for forming a contact hole or a via hole in a semiconductor device comprising:

applying, exposing and developing a photosensitive film on a planarized insulation film to form a photosensitive film pattern; and

dry etching the planarized insulation film using the photosensitive film pattern as a mask and using a plasma having spiral movement sufficiently to form the contact hole or the via hole and round a top edge of the contact hole or the via hole thereby.

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13. (New) A method as defined in claim 12, wherein the insulation film comprises a metal insulation film.
14. (New) A method as defined in claim 12, wherein the insulation film comprises an interlayer insulation film.
15. (New) A method as defined in claim 12, wherein the plasma comprises a fluorine-containing etching gas.
16. (New) A method as defined in claim 12, further comprising:
after forming the contact hole or the via hole, forming a barrier metal film on an inner wall of the contact hole or the via hole; and
filling the contact hole or the via hole with a metal material.
17. (New) A method as defined in claim 16 wherein filling the contact hole or the via hole with the metal material comprises forming the metal material on the barrier metal film.
18. (New) A method as defined in claim 15, further comprising:
after forming the contact hole or the via hole, forming a barrier metal film on an inner wall of the contact hole or the via hole; and
filling the contact hole or the via hole with a metal material.
19. (New) A method as defined in claim 18 wherein filling the contact hole or the via hole with the metal material comprises forming the metal material on the barrier metal film.
20. (New) The method of claim 12, wherein the dry etching step is performed in an ash.

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21. (New) The method of claim 12, wherein the dry etching step comprises rotating the plasma in a magnetic field, the magnetic field generated by a coil surrounding a chamber under a state where an electric field is applied vertically downward in the chamber.